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Feature:

Working to Eliminate Bottlenecks: Florida Hospital's Cardiac Cath Lab Achieves Greater Efficiency and Higher Satisfaction

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In 2006, Florida Hospital, recognized as one of the top cardiac centers in the country, launched a special project focused on process improvement within their cardiac catheterization laboratory. Florida Hospital's cardiac cath lab has seven labs with 52 staff members and a minimum of 93 physicians utilizing their lab each year. The cath lab sees approximately 7500 events annually (each event may have several procedures).

As volumes had increased at the Florida Hospital cath lab, frequent delays and bottlenecks had become more common, prompting a growing chorus of complaints from physicians and patients. Patients would be upset about having to wait too long for an available lab, and the physician might be frustrated and forced to cancel a case because the lab did not have enough staff at a certain time.

Working with an outside consulting group, GE Healthcare Performance Solutions (Waukesha, WI), the hospital decided to take a close look at their current situation and identify opportunities for improvement.

Using a detailed analysis of workflow and scheduling patterns, the cath lab began to establish targets and develop an action plan that would help them achieve and sustain their goals. At a high level, the project encompassed three main objectives:

1. Improving room turnover defined as "gloves off to next patient ready for stick";
2. Optimizing the scheduling process;
3. Raising physician satisfaction.

Gathering Information

To make sure this effort would have the right level of input and buy-in, a cross-functional team was formed. The team began to interview a number of key stakeholders in the hospital. In addition to cardiologists, cath lab staff and administration, they interviewed individuals in support areas such the Health Care Research Unit (HCRU), Critical Care Unit (CCU), Primary Care Unit (PCU), Transport and others. Through this process, some key themes began to emerge. First, there were favorable attributes that could be leveraged, including the hospital's positive reputation, strong leadership, information technology (IT)



HMP COMM

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Cath Lab Digest is its fifth annual salary survey in an attempt to determine the market value of cardiac catheterization laboratory professionals across the country. The survey will be available on our website at www.cathlabdigest.com in PDF file. Cath Lab Digest had 108 survey respondents.

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support, highly competent staff and cardiologists, and an enterprise-wide commitment to excellence.

Regarding specific opportunities for improvement, feedback indicated that department metrics and performance were not always aligned with physician expectations. There was a general feeling that cases rarely started on time and that patient wait time was excessive. Difficulties with scheduling, paperwork, transport and inpatient flow were identified as some of the primary issues impacting the delivery of services in a timely and efficient manner.

The team also noted that room turnover responsibilities were not well-defined. A lack of predictability in scheduling had made coordination of physicians, patient transport, patient floors and HCRU staff very difficult. There were issues with coverage during lunch hours and there were not enough staff to keep the labs running smoothly from 7am to 6pm.

Some cardiologists expressed a preference to have a block of time in the same lab rather than moving from room to room. The unpredictability in the schedule made it difficult for physicians to plan their day. Patients and families were also dissatisfied with delays.

In addition to collecting this "voice of the customer" information, the team went through value stream mapping, a "lean manufacturing" flow chart process originating with Toyota, in order to understand the overall flow and where there might be non-value added steps in the process. The team gathered data to measure current process capability and determine which areas to focus on first. Regression analysis (a type of statistical analysis where a dependent variable is assumed to be a linear function of one or more independent variables) revealed that 91% of the variation in total case turnover time was found in the "empty room" sub-cycle.

Additional findings are summarized below:

- The average outpatient wait time from arrival in registration to procedure start was 145 minutes.
- The median patient wait time in the waiting room was 35 minutes.
- The median time in holding area was 84 minutes, driven primarily by the "patient ready to in room" sub-cycle (91% of variation).
- 81% of outpatients were ready in the holding area for scheduled start.
- Median case turnover, defined as "gloves off to next patient ready," was 61 minutes.
- Median "case end to patient out" time was 13 minutes.
- Median "patient out to next patient in" time was 30 minutes.
- Median "time in lab to case start" was 29 minutes (70% of variation in the "patient ready to case start" sub-cycle).
- Only 1% of first cases started by 7am.
- 12% of first-case patients were ready in the room by 7am.
- 50% of cases started more than 30 minutes late.

Setting Goals and Finding Solutions

Based on physician expectations, the team set a 30-minute target for lab turnover time, from gloves off until next patient ready for stick. For scheduling, the team looked at preferred scheduling for high-volume physicians. They wanted to maximize opportunities



Figure 1. Adding a "roving coordinator" to guide physicians and patients to the right place decreased room turnover time by 20%.

for the physicians to follow themselves, and minimize schedule adjustments on the day of service. To raise physician satisfaction, the team focused on improving the predictability of scheduling, offering preferred scheduling and reducing the lab turnover time. In order to redesign the process for room turnover in the labs, a "Work-Out" was held to foster a greater sense of teamwork and grassroots involvement. A Work-Out is another lean manufacturing tool, which essentially asks those most closely involved with the actual work to rethink and redesign processes for greater efficiency. Participants discussed the issues and brainstormed potential solutions. Some of the key actions that were taken as a result of this session included creating a roving coordinator role, developing a readiness checklist for inpatient floors with training, and clearly defining roles and responsibilities for all technologists.

Optimizing the scheduling process in the cardiac cath lab required reaching consensus across diverse groups and then consistently driving compliance. Efforts were made to develop new scheduling rules in order to increase the efficiency of physicians, staff and equipment. Changes were made to the daily process to better align schedules and provide greater predictability. The adjustments enabled ten physicians to have scheduling slots based on their personal preferences.

The team realized that the key player responsible for coordinating physician and patient flow was also responsible for future scheduling and other tasks. They determined that this was not an optimal use of resources, so the role was split in two. As originally brainstormed, a "roving coordinator" now guides patients and physicians to the right place and someone else handles the future scheduling.

Measuring the Impact

Once the changes had been implemented, the team again collected and analyzed data to re-measure their performance. They found that lab utilization had increased from 60% to 69%. Access to care had improved by 15%, as they were now able to accommodate an additional three patients per day between the hours of 7am and 3pm with the increased capacity.

There was a 50% improvement in the occurrences of "physician following self," which positively affected satisfaction among the cardiologists, as their day was not interrupted. The cath lab achieved greater predictability in their scheduling process, making time in the hospital for physicians more productive.

To maintain results and ensure continuous improvement, a control plan was developed, including digital "dashboards" (a software-based business management tool organizing important data from a variety of sources) to monitor progress on an ongoing basis. The dashboards included key metrics such as lab turnover, case volume and physician satisfaction. Changes in physician volume would be reviewed periodically and adjustments would be made accordingly. Metrics are posted each day and utilized as part of a discussion with lead technologists. The discussion centers on any obstacles that would impede improvement.

"One of the most illuminating discoveries we made through this process is that at times it can be counterproductive to follow your intuition," says Joel Sandler, Administrative Director of Cardiovascular Services at Florida Hospital. "For example, we thought that we should react to early finishes or cancellations by moving cases around to fill every space, but this actually created problems instead of solving them. It turned out that one small move in the schedule would trigger several other moves, ultimately making the schedule more unpredictable — not less!"

Tables 1-3.

Keys to Success

Since this project is an ongoing journey involving continuous improvement, there are always new challenges to overcome, new targets to set and new discoveries to be made. Though the quest for excellence is never-ending, the cath lab team has been pleased with the outcome of this project and their enhanced ability to implement positive change in their environment.

Leadership support and engagement of the team in the process were keys to success in this project. The physicians used to focus solely on the cath lab as the source of issues, but as they have participated more in the process, they are taking more of a global view and seeing how different aspects of care are interrelated.

"I'm getting emails frequently now with ideas from the team as to how they can help make things better — incremental changes to keep the flywheel moving," notes Joel. "This effort really spurred an overall positive shift in mindset to become more process-driven. We've had more constructive comments about processes to be improved instead of complaints about individuals."

"Bringing all stakeholders' points of view to the table helped us understand our processes and identify the opportunities," added John Strickler, Cath Lab Evening Supervisor.

The improved schedule predictability has afforded Florida Hospital the ability to align themselves with outpatient cath labs. They can now provide a table-to-table service for these outpatient cath labs as the needs for intervention arise. This closes the gap between the diagnostic analysis and the interventional process.

Streamlining the department has opened up new slots which can bring significant revenue to the hospital's bottom line. The changes have also been essential in ensuring optimal services for patients by creating a more efficient environment and avoiding delays in scheduling.

By instituting a Roving Coordinator role, Florida Hospital is helping to facilitate the transition through the department. From waiting room to procedure to recovery, the Roving Coordinator will be available to assist the patient, family and staff. The team also created a schedule that best meets the needs of the cardiologist by individually matching their average case duration to procedure schedule time.

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